

REMARKS/ARGUMENTS

35 USC § 102(b)

Claims 1-2 and 4-14 were rejected under 35 USC § 102(b) as being anticipated by Grinsted et al. (U.S. Pat. No. 6,731,018). The applicant disagrees, especially in view of the amendments herein.

In general, the applicant notes that Grinsted's device is suitable for use in two modes, a first, continuous flow mode (*e.g.*, in rivers or tidal zones) and a second, periodic flow mode (*e.g.*, using wave action). In both modes, Grinsted et al. use hydroplane control elements to drive a pressure difference between inside and outside the buoyant apparatus.

In the first mode, the angle of the hydroplanes relative to the flow direction of the water is periodically changed to so drive the open-bottomed buoyant apparatus in a vertical motion relative to the water flow. As the air in the buoyant apparatus is more fluid than the water, a pressure differential is generated that then drives a turbine. This mode is entirely irrelevant to the claimed waver energy harvester.

In the second mode, the angle of the hydroplanes is changed as a function of the wave height such that the open-bottomed buoyant apparatus remains in a substantially constant distance relative to the ground. Therefore, air is forced in or out of the buoyant apparatus and so drives a turbine. Indeed, Grinsted et al. expressly teach that:

"...Vertical movement of the tank is damped by the drag of the hydroplanes. This drag can be supplemented, though this is not always necessary, by reversing the control member or members to produce thrust in a direction opposite to the rise and fall of water in the waves. Thus the tank tends to remain stationary relative to a fixed point, the shore or sea bed say, but the fluid inside the tank is alternately compressed and decompressed by the action of the waves (emphasis added)..." column 3, lines 45-55

In contrast, it should be appreciated that applicant's wave energy harvester relies on the exact opposite. Here the amplifier element is used to increase lift of the device (in addition to the lift provided by unassisted buoyancy) relative to the sea floor as the wave crest passes the

device and to decrease the drop of the device (in addition to the drop provided by unassisted buoyancy) relative to the sea floor as the wave trough passes the device. This difference is clearly recited in the claims:

As amended, claim 1 expressly requires that "...the amplifier element has a shape and is arranged on the harvester such that the *amplifier element is effective* to translate forward velocity of water of a *cresting wave* relative to the element into an *additional upward force* of the entire wave energy harvester as compared to an upward force without the amplifier element...", which is not only inconsistent, but contrary to the device of Grinsted et al. Dependent claims 2, and 4-5 carry the same limitations and the same arguments therefore apply.

Similarly, amended claim 6 expressly requires that the hydrofoil element is arranged on the harvester to produce "...a *supplementary bi-directional vertical force* from a horizontal motion of water of a wave relative to the harvester, wherein the *bi-directional force is directed upwards as the wave approaches a peak* and *directed downwards as the wave approaches a trough*..." Once more, such arrangement is not only inconsistent, but contrary to the device of Grinsted et al. As above, dependent claims 7-10 carry the same limitations and the same arguments therefore apply.

Likewise, amended claim 11 expressly requires that the "... *hydrofoil*...is positioned on the device to *amplify...a buoyant force* of a wave passing the device..." Again, such arrangement is not only inconsistent, but contrary to the device of Grinsted et al. Dependent claims 12-14 carry the same limitations and the same arguments therefore apply.

Moreover, it should also be noted that rejection under 35 USC § 102(b) requires that the "...invention was *patented or described in a printed publication* in this or a foreign country or in public use or on sale in this country, *more than one year prior to the date of the application* for patent in the United States..." However, this is not the case in the instant rejection. Grinsted et al. issued May 4, 2004, while the priority date of the present application is March 26, 2004. Therefore, in light of the amendments and above arguments, the rejection of claims 1-2 and 4-14 should be withdrawn.

35 USC § 103(a)

Claims 3 and 15-17 were rejected under 35 USC § 103(a) as being obvious over Grinsted et al. (U.S. Pat. No. 6,731,018) in view of Warner (U.S. Pat. No. 5,514,023). The applicant respectfully disagrees.

With respect to claim 3, the applicant notes that the same defects and arguments as provided above with respect to claim 1 apply and are not reiterated here. Clearly, Grinsted et al. teach against the presently claimed subject matter and Warner fails to remedy these defects.

Similarly, with respect to claim 15 (and dependent claims 16-17) it is noted that these claims again require "...an *amplifier element* that is *arranged such that the element and the body is additionally raised* by forward water motion of a *cresting wave* moving past the harvester as compared to a harvester without the amplified element..." Again, Grinsted et al. teach against the presently claimed subject matter and Warner fails to remedy these defects.

Moreover, the examiner appears to argue with respect to claim 3 that "...It would have been obvious to one of ordinary skill in the art to modify the hydroplanes of Grinsted's invention with the neutrally buoyant material taught by Warner since doing so would *eliminate a large portion of resistance to the water generator's overall vertical motion...*" Similarly, the examiner appears to argue with respect to claims 15-17 that "...It would have been obvious to one of ordinary skill in the art to modify the open bottomed tank of Grinsted's invention with the neutrally buoyant material taught by Warner since doing so would *eliminate a large portion of resistance to the water generator's overall vertical motion...*"

As pointed out above, Grinsted's device produces energy by counteracting the overall motion of the device using the hydroplanes. Thus, any modification that would eliminate that counteraction would render the device inoperable or significantly less effective for its intended purpose. Therefore, and in addition to the above defects, the person of ordinary skill in the art would not have been motivated to modify Grinsted's device with the neutral buoyant body of Warner. Consequently, in light of the amendments and above arguments, the rejection of claims 3 and 15-17 should be withdrawn.

Claim 18 was rejected under 35 USC § 103(a) as being obvious over Grinsted et al. (U.S. Pat. No. 6,731,018) in view of Warner (U.S. Pat. No. 5,514,023) and further view of Kelly (U.S. Pat. No. 6,644,027). The applicant again respectfully disagrees.

As claim 18 depends on amended claim 15, the same defects and arguments as provided above with respect to claim 15 apply and are not reiterated here. Again, Grinsted et al. teach against the presently claimed subject matter, Warner is an improper reference for combination with Grinsted, and Kelly fails to remedy these defects. Therefore, in light of the amendments and above arguments, the rejection of claim 18 should be withdrawn.


Claims 19-21 were rejected under 35 USC § 103(a) as being obvious over Grinsted et al. (U.S. Pat. No. 6,731,018) in view of Kelly (U.S. Pat. No. 6,644,027). The applicant respectfully disagrees.

With respect to claim 19, the examiner correctly noted that "...Grinsted fails to disclose a wave energy harvester having neutral buoyancy..." Likewise, it should be appreciated that Kelly fails to teach a device having neutral buoyancy. Indeed, Kelly's entire device is *mounted to the sea bed*. Should the office intend to make reference to the moving portion in Kelly's device, it is noted that the *moving portion is a float (numeral 15), which is positively buoyant*. Therefore, neither of the cited references teach a neutrally buoyant wave energy harvester. As claims 20-21 depend on claim 19, the same defects and arguments apply. Thus, in light of the amendments and above arguments, the rejection of claims 19-21 should be withdrawn.

In view of the present amendments and arguments, the applicant believes that all claims are now in condition for allowance. Therefore, the applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,
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